

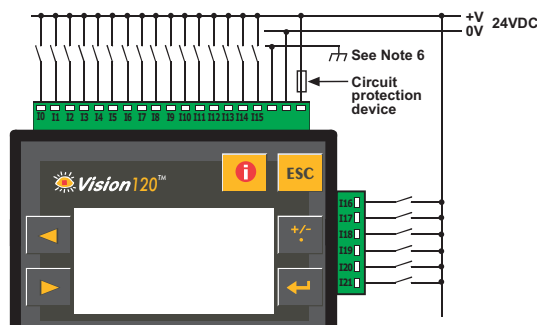
V120-22-R34

Graphic Operator Panel & Programmable Logic Controller

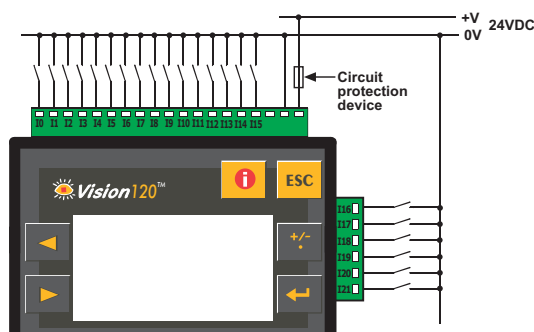
24 VDC, 22 pnp/npn digital inputs, including 2 analog inputs¹ and 3 high-speed counter/shaft encoder inputs, 12 relay outputs, I/O expansion port, 2 RS232/RS485 ports

| | |
|--|--|
| Power supply | 24VDC |
| Permissible range | 20.4VDC to 28.8VDC with less than 10% ripple |
| Maximum current consumption | 290mA@24VDC |
| Digital inputs | 22 pnp (source) or npn (sink) inputs. See Notes 1 and 2 |
| Nominal input voltage | 24VDC. See Note 3. |
| Input voltages for pnp (source): | 0-5VDC for Logic '0' 17-28.8VDC for Logic '1' |
| Input voltages for npn (sink): | 17-28.8VDC/<1mA for Logic '0' 0-5VDC/>3mA for Logic '1' |
| Input current | 3.7mA@24VDC |
| Input impedance | 6.5KΩ |
| Response time (except high-speed inputs) | 10mS typical |
| Galvanic isolation | None |
| Input cable length | Up to 100 meters, unshielded |
| High-speed counter | Specifications below apply when inputs are wired for use as a high-speed counter input/shaft encoder. See Notes 4 and 5. |
| Resolution | 32-bit |
| Input freq. | 10kHz max. |
| Minimum pulse | 40μs |

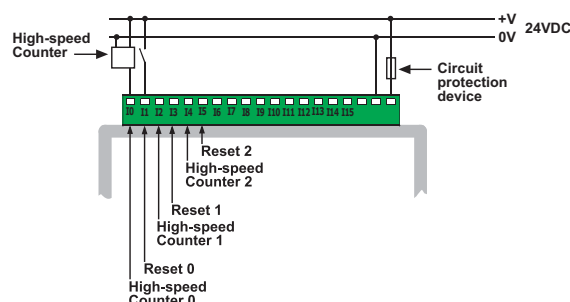
Power supply, pnp (source) inputs



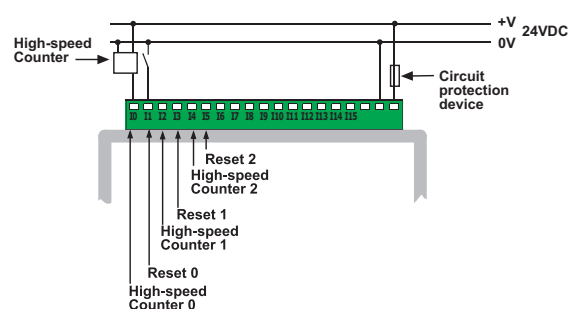
npn (sink) inputs



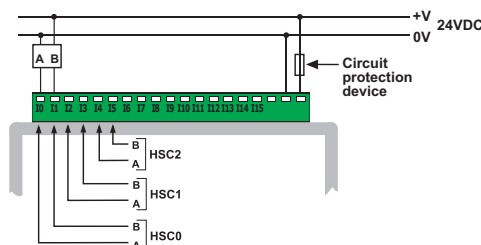
pnp (source) high-speed counter



npn (sink) high-speed counter



Shaft encoder



Notes:

1. The total number of inputs is 22. All of these may be used as normal digital inputs. Via jumper settings and wiring, certain of these inputs may be adapted to analog inputs.
2. All 22 inputs can be set to pnp (source) or npn (sink) via a single jumper and appropriate wiring.
3. npn (sink) inputs use voltage supplied from the controller's power supply.
4. Inputs #0, #2 and #4 can each function as either high-speed counter or as part of a shaft encoder. In each case, high-speed input specifications apply. When used as a normal digital input, normal input specifications apply.
5. Inputs #1, #3 and #5 can each function as either counter reset, or as a normal digital input; in either case, specifications are those of a normal digital input. These inputs may also be used as part of a shaft encoder. In this case, high-speed input specifications apply.
6. To avoid electromagnetic interference, mount the controller in a metal panel/cabinet and earth the power supply. Earth the power supply signal to the metal using a wire whose length does not exceed 10cm. If your conditions do not permit this, do not earth the power supply.

Warnings:

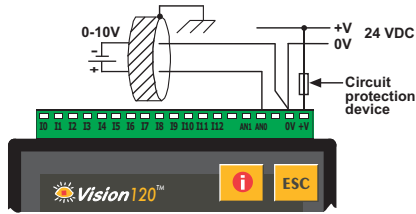
- Unused pins should not be connected. Ignoring this directive may damage the controller.
- Improper use of this product may severely damage the controller.
- Refer to the controller's User Guide regarding wiring considerations.
- Before using this product, it is the responsibility of the user to read the product's User Guide and all accompanying documentation.

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|----------------------------|--|
| Analog Inputs | Two 10-bit, multi-range inputs: 0-10V, 0-20mA, 4-20mA See Note 1 on page 1 |
| Conversion method | Successive approximation |
| Input impedance | >150K Ω for voltage 243 Ω for current |
| Galvanic isolation | None |
| Resolution (except 4-20mA) | 10-bit (1024 units) |
| Resolution at 4-20mA | 204 to 1023 (820 units) |
| Conversion time | Synchronized to scan time |
| Absolute max. rating | $\pm 15V/30mA$ |
| Full scale error | ± 2 LSB |
| Linearity error | ± 2 LSB |
| Status indication | Yes, See Note |

Note:

The analog value can also indicate when the input is functioning out of range.
If an analog input deviates above the permissible range, its value will be 1024.

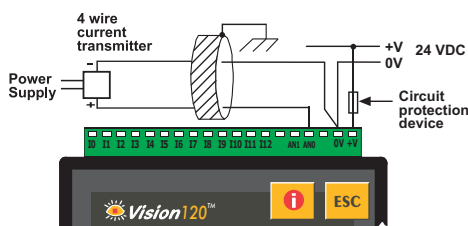
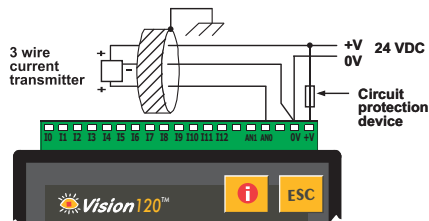
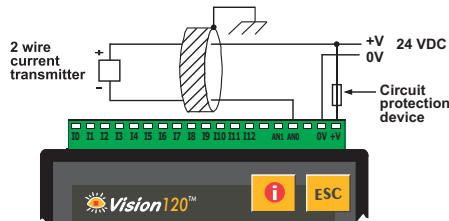
Voltage connection



Notes:

- Shields should be connected at the signals' source.
- The 0V signal of the analog input must be connected to the controller's 0V.

Current connections



Notes:

- Shields should be connected at the signals' source.
- The 0V signal of the analog input must be connected to the controller's 0V.

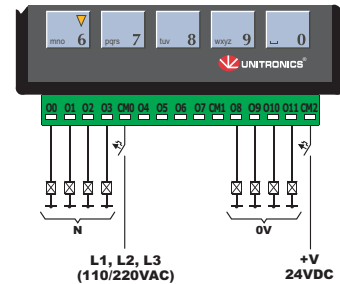
| | |
|---------------------------------|--|
| Relay outputs | 12 relay (in 3 groups) See Note |
| Output type | SPST-NO (Form A) |
| Type of relay | Tyco PCN-124D3MHZ or compatible |
| Isolation | by relay |
| Output current (resistive load) | 3A max per output 8A max total for common |
| Rate voltage | 250VAC / 30VDC |
| Minimum load | 1mA@5VDC |
| Life expectancy | 100k operations at maximum load |
| Response time | 10mS (typical) |
| Contact protection | External precautions required (see below) |

Note:

Outputs #0, #1, #2 and #3 share a common signal.
Outputs #4, #5, #6 and #7 share a common signal.
Outputs #8, #9, #10 and #11 share a common signal.

Relay Outputs

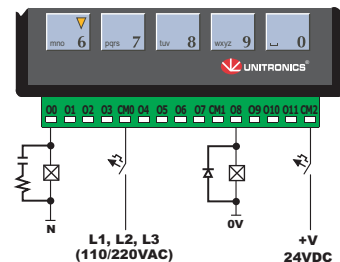
- Each Output can be wired separately to either AC or DC as shown below.
- The 0V signal of the relay outputs is isolated from the controller's 0V signal.



Increasing Contact Life Span

To increase the life span of the relay output contacts and protect the device from potential damage by reverse EMF, connect:

- a clamping diode in parallel to each inductive DC load.
- an RC snubber circuit in parallel with each inductive AC load.



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|------------------------|--|
| Graphic Display | STN, LCD display |
| Illumination backlight | LED, yellow-green, software-controlled |
| Display resolution | 128x64 pixels |

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|----------------|-----------------|
| Keypad | Sealed membrane |
| Number of keys | 16 |

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| Program | |
| Application memory | 448K |
| Memory Bits (coils) | 4096 |
| Memory Integers (registers) | 2048 |
| Long Integers (32 bit) | 256 |
| Double Word (32 bit unsigned) | 64 |
| Floats | 24 |
| Timers | 192 |
| Counters | 24 |
| Data Tables | 120K (RAM) / 64K (FLASH) |
| HMI displays | Up to 255 |
| Execution time | 0.8µs for bit operations |

| | |
|---------------------------------|--|
| RS232/RS485 serial ports | Used for: <ul style="list-style-type: none"> • Application Download/Upload • Application Testing (Debug) • Connect to GSM/GPRS or standard telephone modem: <ul style="list-style-type: none"> - Send/receive SMS messages - Remote access programming • RS485 Networking |
| RS232 (see note) | 2 ports |
| Galvanic isolation | None |
| Voltage limits | ±20V |
| RS485 (see note) | 2 ports |
| Input voltage | -7 to +12V differential max. |
| Cable type | Shielded twisted pair, in compliance with EIA RS485 |
| Galvanic isolation | None |
| Baud rate | 110 – 57600 bps |
| Nodes | Up to 32 |

Note:
RS232/RS485 is determined by jumper settings and wiring.
Refer to the controller's User Guide regarding communications.

| | |
|---------------------------|---|
| I/O expansion port | Up to 128 additional I/Os, including digital and analog I/Os, temperature and weight inputs and more (number of I/Os may vary according to expansion model) |
|---------------------------|---|

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|-------------------------|---|
| Miscellaneous | |
| Clock (RTC) | Real-time clock functions (Date and time). |
| Battery back-up | 7 years typical at 25°C, battery back-up for RTC and system data. |
| Battery | Coin type, 3V lithium battery, CR2450 |
| Weight | 310g (10.9 oz.) |
| Operational temperature | 0 to 50°C (32 to 122°F) |
| Storage temperature | -20 to 60°C (-4 to 140°F) |
| Relative Humidity (RH) | 5% to 95% (non-condensing) |
| Mounting method | DIN-rail mounted (IP20/NEMA1) Panel mounted (IP65/NEMA4X) |

V120-22-R34

I/O Jumper Setting

The tables below show how to set a specific jumper to change the functionality of the controller. To open the controller and access the jumpers, refer to the directions at the end of these specifications.

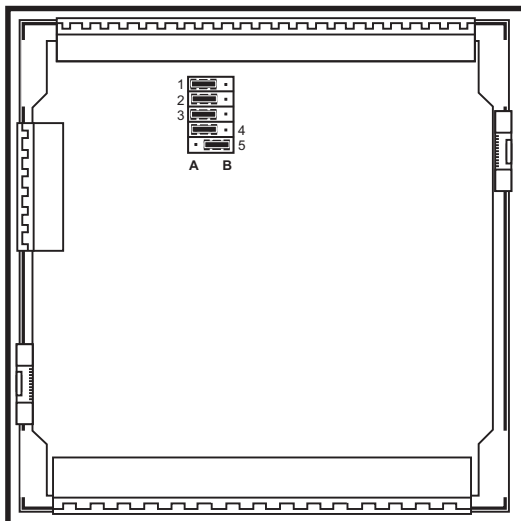
Important:

Incompatible jumper settings and wiring connections may severely damage the controller.

| | Jumper # | NPN | PNP* |
|----------------|----------|-----|------|
| Digital Inputs | JP3 | A | B |

| | Jumper # | Voltage | Current | Digital* |
|----------------|----------|---------|---------|----------|
| Analog 1 / I14 | JP1 | A | A | B |
| | JP4 | A | B | B |
| Analog 0 / I15 | JP2 | A | A | B |
| | JP5 | A | B | B |

*Default factory setting

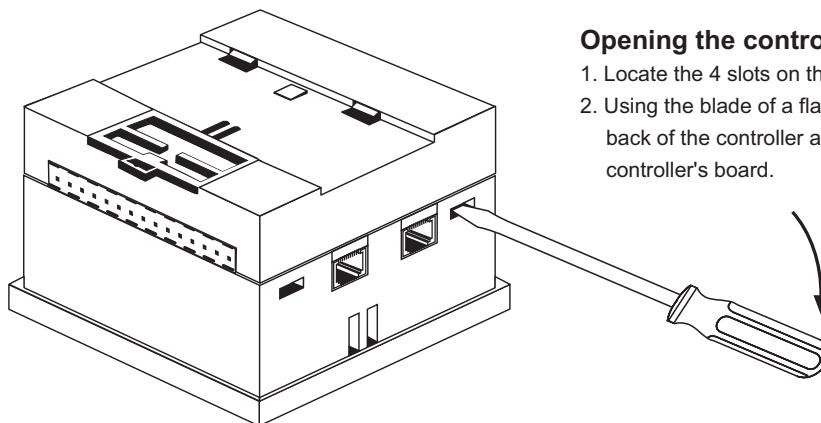


In this figure, the jumper settings will cause the controller to function as follows:

Digital inputs: npn, 24VDC inputs

Analog input 1: Voltage input

Analog input 0: Current input



Opening the controller enclosure

1. Locate the 4 slots on the sides of the enclosure
2. Using the blade of a flat-bladed screwdriver, gently pry off the back of the controller as shown in the figure below, exposing the controller's board.

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